

What is claimed is:

1. A wiring substrate comprising:

two or more wiring layers;

insulation layers interposed between said neighboring wiring layers and containing an organic resin; and

via formed in the insulation layers as to connect said wiring layers one another,

wherein said via is characterized in containing a plurality of functional substances while keeping voids in the surroundings, and

wherein the voids include first voids where at least the organic resins from the insulation layers exist and second voids where a gas exists.

2. The wiring substrate as claimed in claim 1, characterized in that said second voids are selectively formed in the portions where the agglomerated functional substances exist.

3. The wiring substrate as claimed in claim 2, characterized in that said second voids have a smaller average volume than the average volume of a plurality of the respective functional substances forming at least the agglomeration portions among the functional substances.

4. The wiring substrate as claimed in claim 1, characterized in that said functional substances are one or more conductive fillers, and

that said insulation layers are made of composite

materials of organic or inorganic woven cloth impregnated with said organic resins or composite materials of organic or inorganic non-woven cloth impregnated with the organic resins.

5. The wiring substrate as claimed in claim 1, characterized in that said functional substances are one or more conductive fillers, and

that said insulation layers are made of composite materials containing organic or inorganic fillers and said organic resins.

6. A wiring substrate comprising:

two or more wiring layers;

insulation layers interposed between said neighboring wiring layers; and

via formed in the insulation layers as to connect said wiring layers one another,

wherein said insulation layers comprise films and adhesive layers containing adhesives and formed at least one side, and

wherein said via contain functional substances and the adhesives of said adhesive layers penetrating and existing in the voids in the surroundings of the functional substances.

7. The wiring substrate as claimed in claim 6, characterized in that said voids include first voids where at least said adhesive exist and second voids where a gas exists.

8. The wiring substrate as claimed in claim 7, characterized

in that said functional substances are agglomerated and said second voids are selectively formed in the portions where the agglomerated functional substances exist, among said functional substances.

9. The wiring substrate as claimed in claim 8, characterized in that said second voids have a smaller average volume than the average volume of a plurality of the respective functional substances forming at least the agglomeration portions among the functional substances.

10. The wiring substrate as claimed in claim 8, characterized in that the volume ratio of said functional substances occupying said via is 30% or higher.

11. A method for manufacturing a wiring substrate comprising:

a first process of forming via in which voids are formed by filling functional substances in via holes formed in an insulation substrate containing an organic resin and removing at least some of the functional substances; and

a second process of making said voids be first voids in which at least an organic resin from the insulation substrate exists and be second voids in which a gas exists.

12. The method for manufacturing a wiring substrate as claimed in claim 11, characterized in that said functional substances are agglomerated and said second voids are selectively formed in the portions where said agglomerated functional substances exist in said second process.

13. The method for manufacturing a wiring substrate as claimed in claim 11, characterized in that the average volume of said second voids is made smaller than the average volume of a plurality of the respective functional substances forming at least the agglomeration portions in said second process.

14. A method for manufacturing a wiring substrate comprising:

a first process of forming via in which voids are formed by filling functional substances in via holes formed in an insulation substrate of a film bearing an adhesive layer containing adhesives in at least one side; and

a second process of penetrating the voids of said via hole with the adhesive of said adhesive layer.

15. The method for manufacturing a wiring substrate as claimed in claim 14, characterized in that said voids are selectively penetrated with said adhesive in said second process.

16. The method for manufacturing a wiring substrate as claimed in claim 15, characterized in that first voids are penetrated with the adhesive by being selectively penetrated with said adhesive by agglomerating said functional substances and second voids where a gas exist are formed in said second process.

17. The method for manufacturing a wiring substrate as claimed in claim 16, characterized in that the average volume of said second voids is made smaller than the average volume of a plurality of the respective functional substances forming at least the agglomeration portions in said second process.

18. The method for manufacturing a wiring substrate as claimed in claim 11, characterized in that said first process is carried out using one or more conductive fillers as said functional substances and comprises a step of filling said via holes with a conductive paste containing the conductive fillers and an organic binder and a step of removing at least a part of the organic binder of said conductive paste.

19. The method for manufacturing a wiring substrate as claimed in claim 18, characterized in that said organic binder contains a volatile component and at least a part of said organic binder is removed by evaporating said volatile component.

20. The method for manufacturing a wiring substrate as claimed in claim 18, characterized in that at least a part of said organic binder is removed by sucking said organic binder.

21. The method for manufacturing a wiring substrate as claimed in claim 11, characterized in that said first process is carried out using one or more conductive fillers as the functional substances and comprises a step of filling said via holes with the conductive fillers.

22. The method for manufacturing a wiring substrate as claimed in claim 21, characterized in that said conductive fillers are granulated bodies produced by granulating conductive particles.

23. The method for manufacturing a wiring substrate as claimed in claim 11, characterized in that the first voids are

penetrated with the organic resin by applying pressure to an insulation substrate in the thickness direction by metal conductors disposed in both sides of the insulation substrate.

24. The method for manufacturing a wiring substrate as claimed in claim 14, characterized in that the voids in via are penetrated with the adhesive by applying pressure to an insulation substrate in the thickness direction by metal conductors disposed in both sides of the insulation substrate.

Sub A1
~~25. The method for manufacturing a wiring substrate as claimed in either claim 11 or claim 14, characterized in that said metal conductors are either metal foils or wiring patterns.~~

add A2